Enhancing Effectiveness of Membrane Keypad by Backlighting

Backlit membrane keypads Backlit Membrane Keypad is an keypad with a membrane switch with the internal component that permits light to be reflected across the keypad's areas without *loss of* the keypad's tactile feeling to the user.

With tactile touch the user gets a better feeling of touch. The feel is clearly perceived because the button popping back up when you press it. This feature isn't present with non-tactile switches. Find out what is the differences between non-tactile and tactile feedback systems that are customized for input devices!

Linepro has been leading the way in offering high-quality backlit membrane keypads, as well as silicon or rubber keypad assemblies. We have Engineering and Design Engineers have worked with our suppliers of components and materials to develop keypads that are appealing as well as *strategically* noticeable. We're always looking to design fully backlit membrane keyboards while maintaining its slim profile. Today, we can offer affordable backlit keys as well as logos, icons and icons. They are colored in multiple colors and be lit separately or together.

What are the Backlighting Options for Membrane Keypads?

One way to improve the user experience and differentiate your product from other products is to incorporate lighting within the layout of keypads made of membrane. Backlighting of the membrane keypads involves carefully incorporating lighting into the design of the keypads to make the keys as well as the legends as well as displays accessible. There are design as well as cost advantages and disadvantages to think about based on the backlighting method used. Linepro will help you select the most efficient method for backlighting the user interface and offers the full range of backlighting methods which include:

Light Guide Film (LGF)

Light Emitting Diodes (LED)

Electroluminescent (EL) Lighting

Fiber Optic Lighting

Linepro also provides other keyboards with backlighting like the dead-front area which has icons that aren't visible until they're lit. Learn more information about these technologies and the options available.

Light Guide Film (LGF)

Light Guide Film used for backlighting in Membrane Keypad that requires a the use of a thin profile

LGF Light Guide Film (LGF) is a thin, light-absorbing technology that directs light that is generated by side-firing or right-angle LEDs across the area that needs to be illuminated.

The advantage of LGF is the fact that it is able to be constructed to almost any shape and size, allowing the same illumination of the keypad on the membrane across a variety of zones.

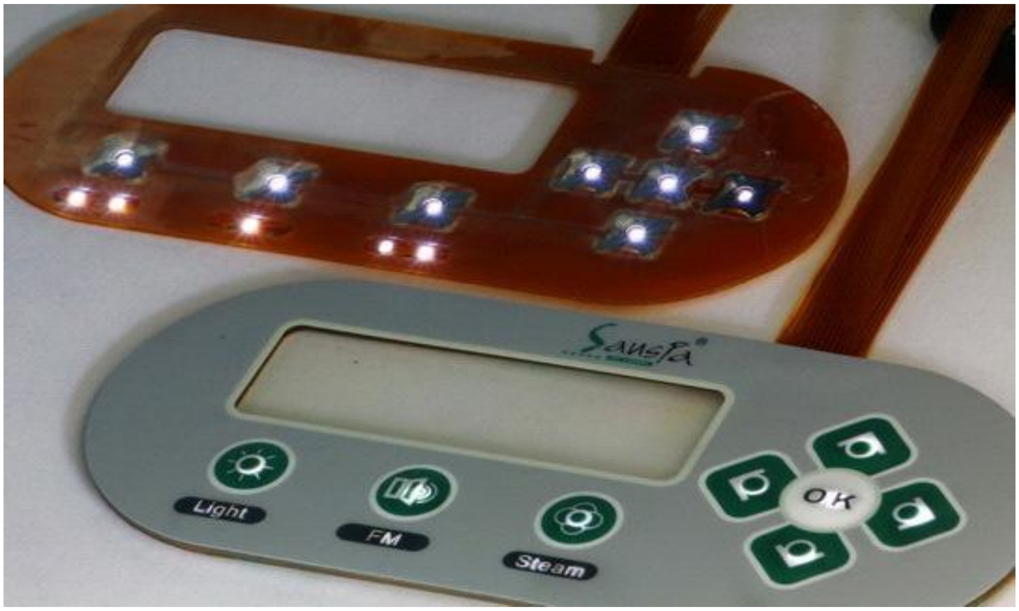
Multiple LGF films can be utilized in a single program to give distinct backlighting for various graphic elements.

The different colors and hues of LEDs are able to be utilized to create unique illumination effects. White LEDs are a great option to reflect different images on the overlay.

Although Light Guide Film can be more expensive than other technologies for backlighting, but it does have numerous advantages:

- It's because the LGF is able to be very thin and therefore, it can integrate into membrane keypads which aren't allowed to over a certain thickness (i.e. small, lighter devices)
- LGF has minimal effect upon it's tactile sensation of buttons.
- LGF offers backlighting even in smaller spaces as well as in situations when the light stays on even when the switch is turned on.

Light Emitting Diodes (LED)



LED implanted underneath the Graphic Overlay of Membrane Keypad

LEDs also referred to as luminescent diodes are commonly used to light up the night. They are a well-known an inexpensive point source lighting method. LEDs with embedded LEDs emit only a small amount of heat and come in a variety of colors including green, red and yellow white and bi-color lamps. Diverse strengths are available with some that are specifically made for use in outdoor environments.

Surface mount LEDs are integrated into the switch structure constructed from polyester which provide a durable and affordable source of light. A greater variety of lamp styles is available to PCB Membrane Switches and Copper Flex membrane keypads and they are also placed through holes to increase the longevity.

Other benefits of LED backlighting include:

- Reliability and long-term durability typically over 100,000 hours
- Low cost
- The power consumption is effective and can be operated even at low voltages.
- Available in a variety of intensities, colors and lamp sizes

Electroluminescent Lamp (EL)

Lamps that emit electroluminescence contain phosphors that convert electricity directly into light. Because Electroluminescence is efficient, conversion results in low energy consumption as well as losses caused by the emission of heat or IR emissions are lower. EL backlighting systems therefore consume very little power during normal usage. They are great for those applications that require little or no illumination where the backlight isn't always on since the phosphor is susceptible to degradation when exposed to prolonged time periods at high voltages and frequencies. The life expectancy of an EL lamp is dependent on its quality Phosphor utilized and how often the lamp is powered.

Other characteristics and design aspects for EL lamps are:

•El lamps use only a tiny amount of energy

•It gives the same and evenly balanced backlighting for the keypads of the membrane across the entire length of the

•It requires a DC into AC converter to operate.

•A slim profile and durable design makes it ideal for the majority of membrane switch designs.

•Only a handful of color selection is available

Fiber Optic Lighting

Fiber Optic is being used for backlighting membrane keypads

The typical fiber-optic lamp consists of between two and three layers weaved optical fiber that is created into an area of light-emitting that is rectangular. The fibers that emerge from the opposite end are wrapped in the shape of a circular ferrule and then joined with a few or one LED lights. These lamps can be a cost-effective way to ensure greater consistency of backlighting over large areas of the keypad's membrane. Fiber optic backlighting guarantees that light, typically emanating from LEDs is evenly distributed across the graphic overlay through the use of very thin plastic fibers.

Other aspects and design elements of fiber optic lighting are:

•Longer life span compared to LED lamps, which usually will last 100 years in a given average of LED

•A low power requirements of 20-50 mA for LEDs

•uniform luminosity to illuminate large membrane Keypad backgrounds

•The fiber optic lamps do not emit thermal energy or create electromagnetic interference

•Can stand up to the extreme temperatures and extreme humidity

Keypads with backlit LEDs can bring advantages to the product, such as:

•Enhancing appearance of users using the product in dim or dimly illuminated surroundings

•Inputs and keys are simpler to locate and to read

•Paying the eye to a particular location such as lights on a display

•Contemporary looks of the equipment creating a style that is attractive

•Facilitating access of products easier for disabled people.

There are a variety of techniques that could be used to create the desired backlight effects on keypads with membranes based on the power needs and the setting in which the device is utilized in. If it's nighttime or utilized in the day, or the complex nature of the arrangement, Linepro will assist you in determining the best lighting solution that meets your needs. To learn more about why our exclusive selection of Membrane Keypad always trend in the market, click here!